



# Quick Guide for ECGLab

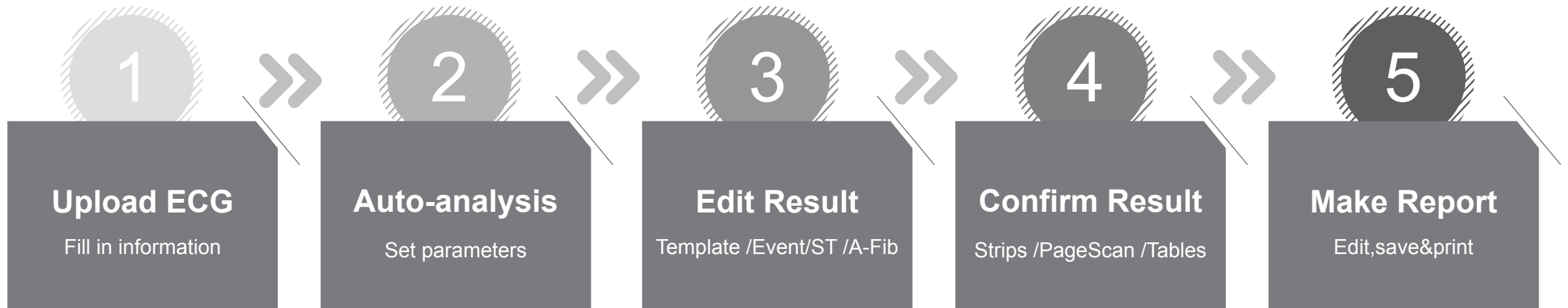
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Made by Carol Wen

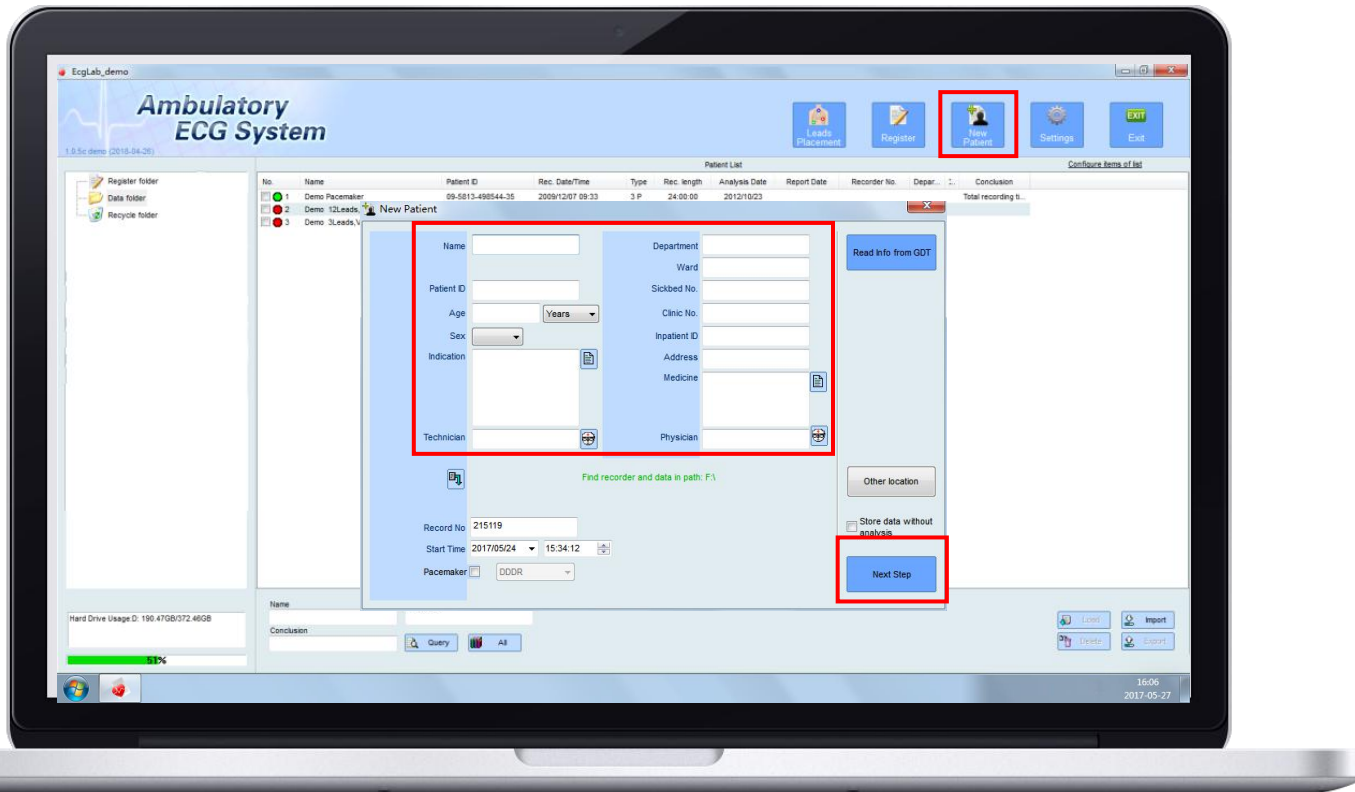
## **Previous Remarks**

This quick guide is for new users of ECGLab. It's just for reference and you can use in your own way once get familiar with the software. More details see the official manual.

# Basic Analysis Process



# 1. Upload ECG data



1. Connect holter recorder with PC.

2. Double click  to run the software.

3. Click **New Patient** on main interface.

4. Fill in patient information.

5. Click **Next Step**.

## Q1. Can not find recorder.

Reconnect the recorder with PC and try again.

Click Refresh icon  on the left.

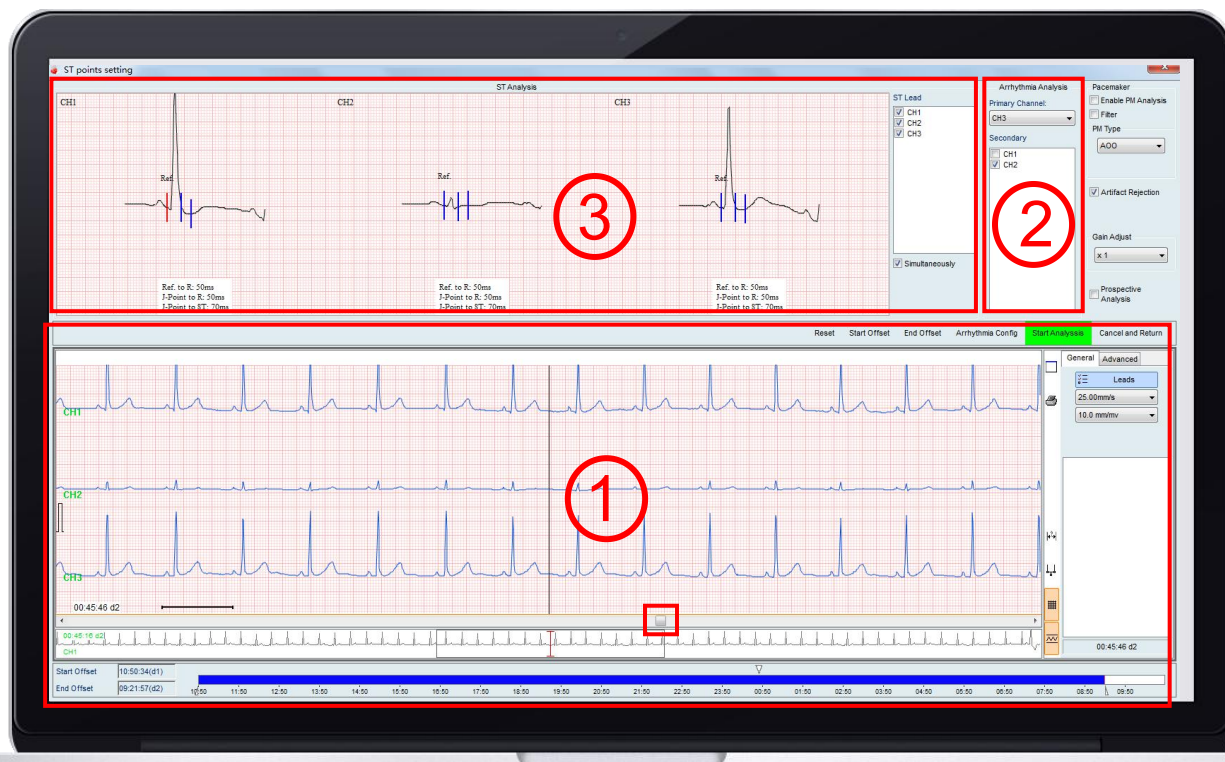
Click **Other location** to choose path by manual.

## Q2. Weather all information need to fill in?

**Name**, **Patient ID** and **Start time** are required information.

The others you can fill in or not.

## 2. Set Parameters



### 1.View all ECG waveforms.

Drag slider in chart 1,use **Start offset/ End offset** to reset the time if there are invalid waveforms at the start or end period.

The beat type has marked in the first 5 mins' waveform,check if most of them are right.

### 2.Choose analysis channel.

Primary CH---most clear channel

Secondary CH--for P wave /ST analysis or other purpose.

### 3.Set Ref and J point for ST analysis.

Double click the vertical line and move it when it turns into red.

### 4.Click **Start Analysis**.

#### Q1. The more channel chosed the better?

No,if you choose too many channel,the software auto-analysis will take more time,and there can be too much artifact added into the result.

Better choose 1 or 0 secondary channel .

#### Q2. What's the use of other icons?

Pacemaker---Enable it when the patient wore pacemaker

Gain Adjust---When the waveform is too flat or tall

Too flat Gain 2 or 4 Too tall Gain 1/2 or 1/4

## 3.1 Confirm information

The screenshot shows a software window titled 'demo' with a menu bar containing 'Patient', 'Template', 'Events', 'ST', 'A FIB/Fut', 'Stops', 'PageScan', 'Tables', 'Reports', and 'Exit Record'. The main area is divided into sections for patient information. The 'Patient Information' section includes fields for Name (with a dropdown), Patient ID, Sex (set to 'Female'), Age (53 years), and Indication. The 'Other' section includes fields for Technician and Physician. The 'Setting' section includes Start Date (2007/12/04), Start Time (10:50:34), and Record No. On the right side, there are buttons for 'Update', 'Analysis Setting', and 'Reanalyse'. The 'Analysis Setting' and 'Reanalyse' buttons are highlighted with red boxes. The bottom status bar shows the time 16:06 and date 2017-05-27.

1. Supplementary more patient information.

### Q1. What's the use of **Analysis Setting**?

Set parameters separately for this ECG data, Click **Reanalyse** after adjusting the analysis parameters

If only change the display content for example address, no need to reanalyse.

### Q1. What's the use of **Reanalyse** ?

If the analysis result is not good in template interface, click **Reanalyse**, change the parameter (analysis CH, Gain and so on) and analysis again.

## 3.2 Edit template



### 1. Check the template accuracy.

If you find hundreds of **Unknown** beats, or a lot of **S** beat are marked as **N** beat, please reanalyse before edit.

### 2. Start from the type with small number.

For example, **Unknown**-- **S/V**--**N**

### 3. Skillfully use the tools.

Use Histogram / Lorenz plot / Focus tools to make batch judgement and modify.

#### Q1. What if too many unknown or wrong mark?

1. If too many **S** marked as **N**, use **SVE Configure** tool on the left.

a. Reduce **value 1** from 20 to 18 / 16.

b. Increase **value 2** from 20 to 25/30...50.

Click **Re-analyse** once changed the value.

Note: Ensure **Value 3** are checked on.

2. If too many **unknown** beat, or the analysis result is not good.

Back to **Patient** interface and click **Reanalyse**.

a. change primary CH or secondary CH.

b. Adjust Gain into 1/2, 1/4 (if the waveform is too tall), 2, 4 (if too flat).



## 3.3 Events confirm



1. Select a typical strip of each type to save.

Chart 1--- statistics of events.

Chart 2--- 24 hr heart rate.

Chart 3 --- ECG strip for selected event type.

Chart 4 --- RR interval histogram.

Chart 5 --- Real-time waveform for chart 3.

**Q1. Can not see Chart 4?**

Click Histogram in Chart 1 to show/hide it.

**Q2. How to check the detail event in certain period?**

Hold down the ctrl key and drag mouse between events in Chart 2 can zoom in this period.

▼ Black triangle in chart 2 shows the saved event position.



## 3.4 ST segment analysis



1. Check if the ST segment deviation statistics are correct.

**Chart 1** --- statistics of excessive ST deviation.  
Click **Add** or **Tool** to adjust setting if necessary.

**Chart 2** --- 24 hr heart rate.  
Reference for judgement of the condition.

**Chart 3** --- ST deviation from baseline.

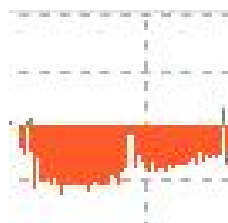
**Chart 4** --- Real-time waveform for chart 2&3

### Features of ST segment elevation /depression

Onset	Dur...	Ma...	Lead
<input type="checkbox"/> 11:17:22	1.1	-1.5	CH1
<input type="checkbox"/> 11:55:46	1.1	-1.6	CH1
<input type="checkbox"/> 15:00:25	1.9	-2.0	CH1
<input type="checkbox"/> 07:14:14	4.7	-1.5	CH1
<input type="checkbox"/> 07:17:31	3.8	-1.2	CH3
<input type="checkbox"/> 07:25:57	2.4	-1.5	CH3

**Chart 1**

All data possible



**Chart 3**

Red color and long length  
in vertical period



**Chart 4**

ST segment deviate  
from baseline

## 3.5 A-Fib/Flut confirm



1. Check if the A-Fib/Flut statistics are correct.

Chart 1 --- 24 hr RR trend

Every 5 mins as a unit in timeline

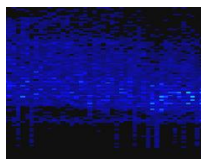
Chart 2 --- Statistics of A-Fib/Flut interval.

Chart 3 --- The 5 min period RR trend for chart 1.

Chart 4 --- Real-time waveform for chart 3.

### Features of A-Fib/Flut period

Chart 1



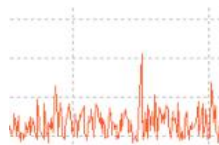
Blue dots widely distributed

Chart 2

Start Time	End Time	Duration
09:15:59	15:32:04	06:16:04
18:49:51	18:51:17	00:01:26
19:02:56	19:03:20	00:00:23
19:11:28	19:13:40	00:02:12
19:16:44	20:55:45	01:39:01
00:05:50	00:06:02	00:00:12
00:07:59	00:08:31	00:00:32
00:20:08	00:20:16	00:00:08
00:21:41	00:22:11	00:00:30

All data possible

Chart 3



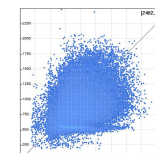
Red line is uneven and irregular

Chart 4



P wave looks like serrate

Lorenz



Fan-shaped distribution

## 4. Confirm Result



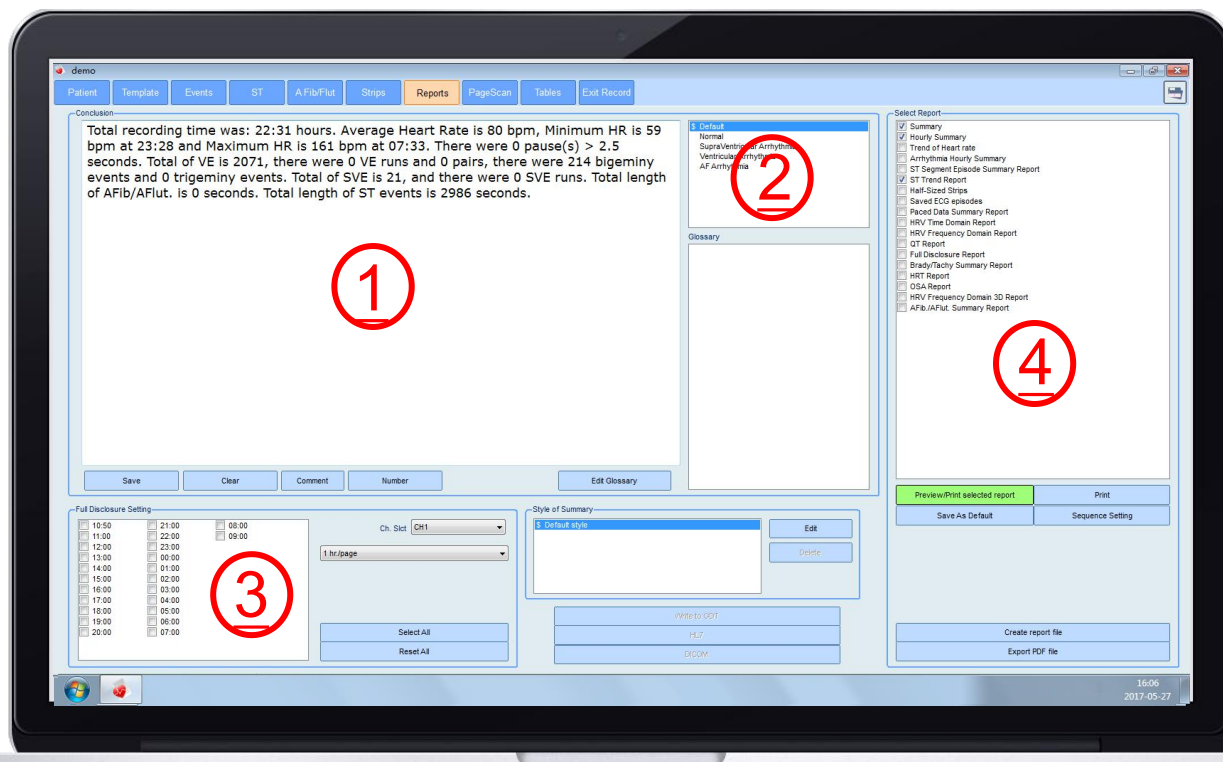
1. Confirm saved ECG strip.

2. Overview and check in PageScan.

Right click on the trend graph(at the top),you can change it into all kinds of Histogram.

3. Overview and check in Tables.

# 5. Report Edit



1. Make conclusion.

2. Choose full disclosure period.

3. Choose report type and save or print.

Chart 1 --- Conclusion area.

Chart 2 --- Conclusion pattern for quick edit.

Chart 3 --- Full disclosure setting.

Chart 4 --- Report choose and process.

## Q1. How to make quick conclusion?

Save the most usual conclusion in chart 2 and call them anytime you need

## Q2. How to process report quickly?

1. Check the most commonly used reports and click [Save as Default](#).

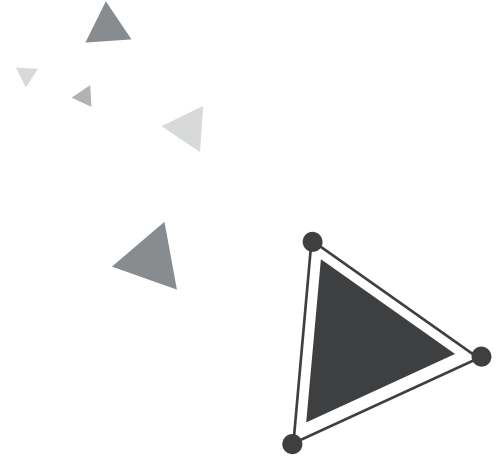
It will effect for all ECG data.

Click [Sequence Setting](#) and move the most usual report to the top and save

# Small Tips

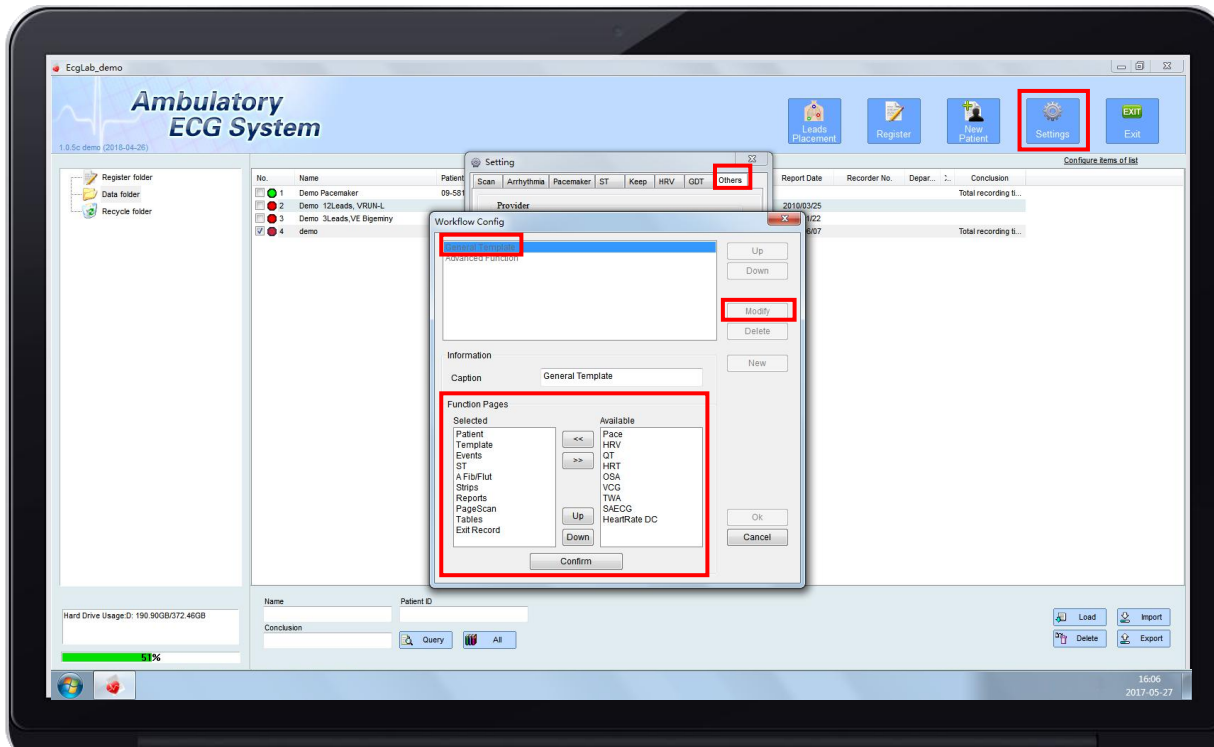
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Adjust workflow / Set signature / Advanced fuction







# Small tips--Adjust workflow



1. Click **Settings** in main interface

2. Change into **Others** window.

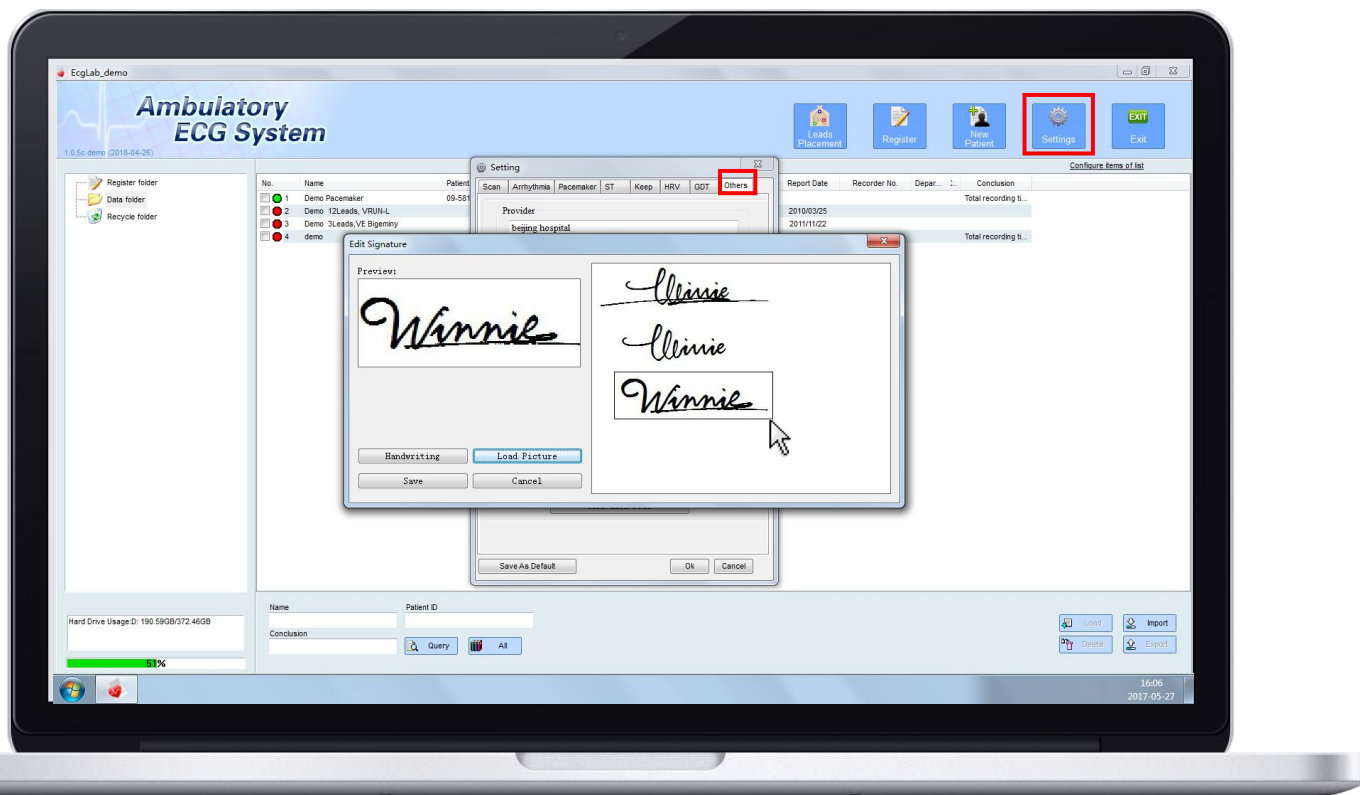
3. Click **Workflow Configure** then click **General Template--Modify**

4. Select process with button  or  .  
Items on the left is the selected ones.

5. Adjust the order with button  or  .



# Small tips--Set signature



1. Click **Settings** in main interface

2. change into **Others** window.

3. Click **Set Signature**

a. Click **Handwriting** and edit direct.


b. Click **Load picture** and choose picture (JPEG/BMP format) .

Click and drag in the picture and choose the needed part.

The picture on the left will be taken as signature shows on report.

# Small tips--Advanced fuction



1. Click button  on the right top corner, you can change into advanced fuction.

2. Bellow dvanced fuction need to pay to open.

Multi-day ECG data merge and analysis together\*

Lorenz Plot Edit\*

Waterfall Tools on A-Fib Edit\*

T-wave Alternans\*

Deceleration capacity of heart rate\*

Late potentials (SAECG)\*

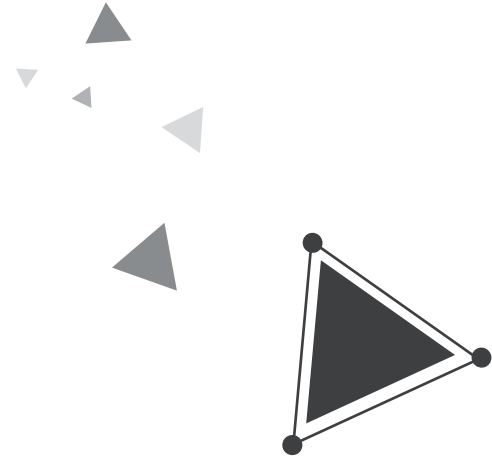
Vectocardiogram (VCG)\*

3. Click button  to back to Gernal template.

# Skills for edit Tools

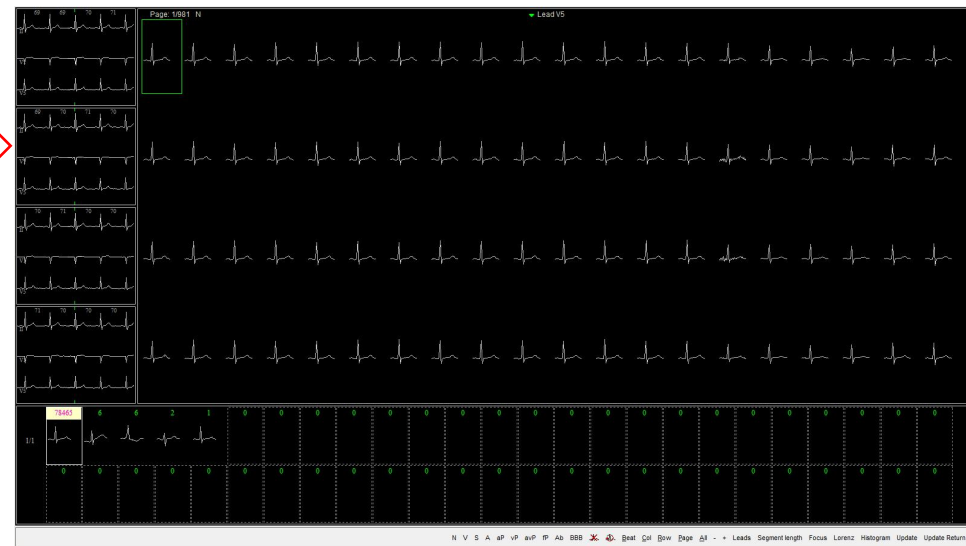
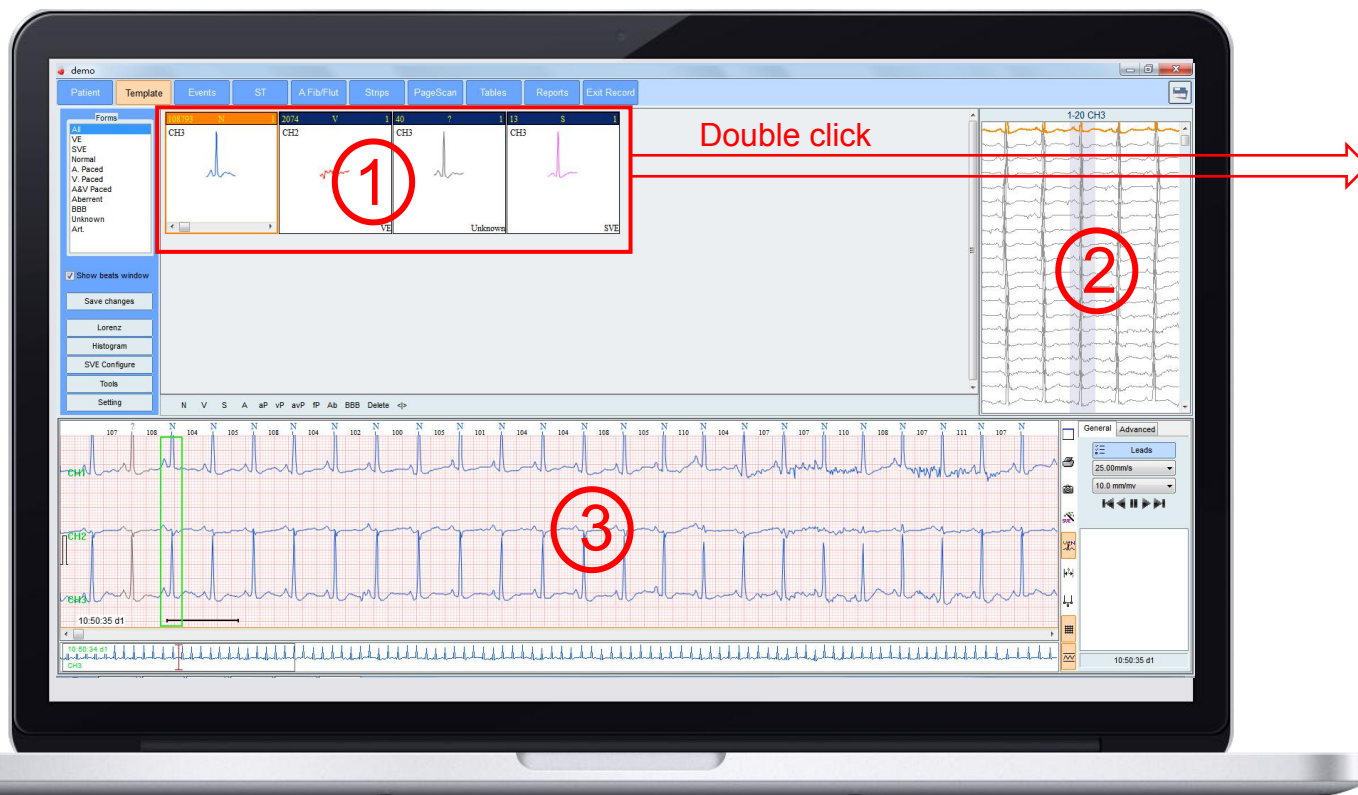
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Template / Lorenz Plot / Histogram / Focus / ST/ A-Fib&Flut



# 1.Template

Function: Classify the same shape and make batch audit.



Secondary classification

First classification

The selected beat will synchronous display on chart 1&2&3.

Press up/down key on keyboard to switch beats.



Double click and edit in secondary classified folder if it's in large number.

Modify beat type with toolbar / shortcuts / right click items.

Commonly used shortcuts

**V** or **1** : Ventricular beat

**S** or **2** : Supraventricular beat

**N** or **3** : Normal beat

**X** : Delete

## 2. Lorenz Plot

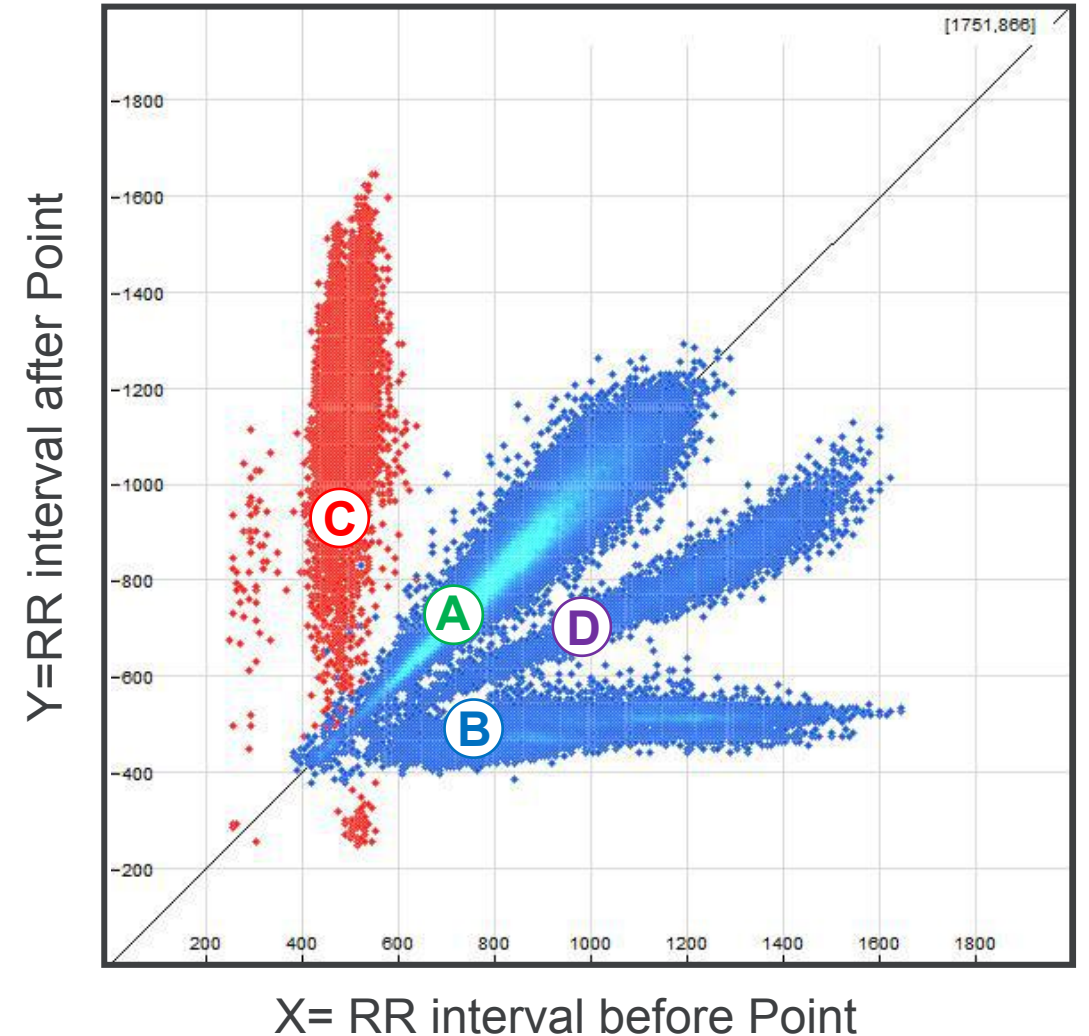
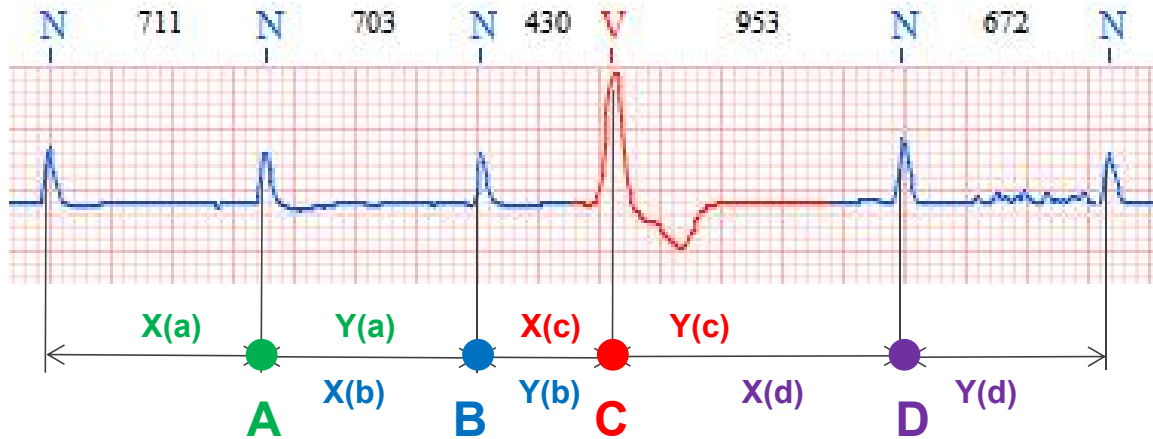
Principle: mark every beat as a point on a graph follow rule below,

$X(n) = \text{interval } (n-1 \text{ to } n)$      $Y(n) = \text{interval } (n \text{ to } n+1)$

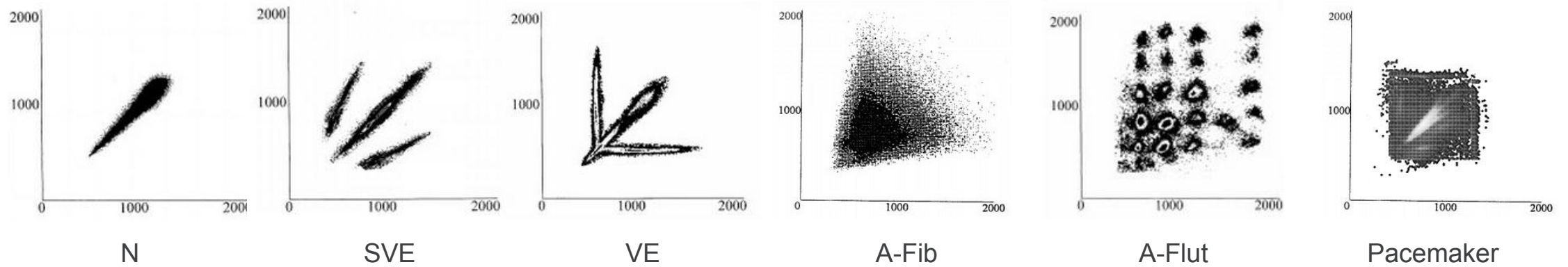
Certain shape will form due to different type arrhythmias.

Function:

- Rapid diagnosis based on overall shape.
- Correct wrong marks by area.



## 2. Lorenz Plot — Rapid diagnosis based on overall shape

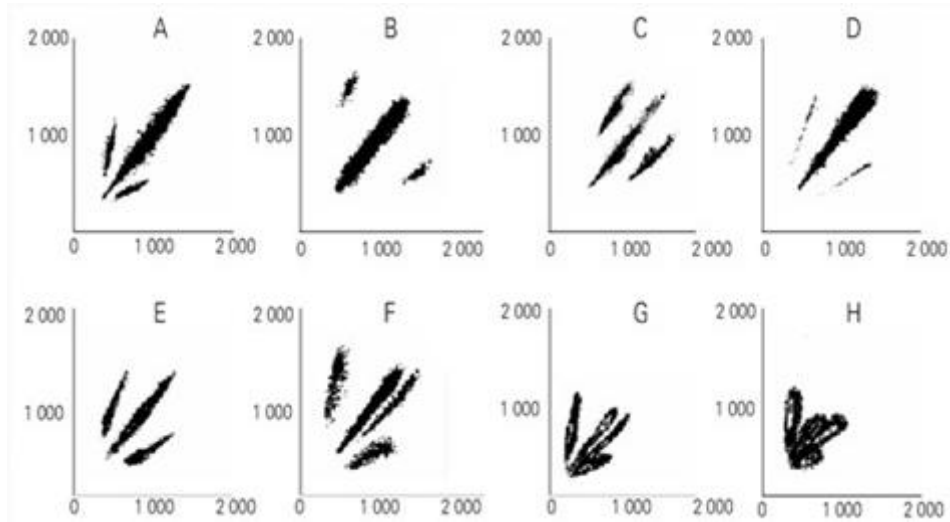


### Typical arrhythmia in Lorenz Plot

Overview all beats and make a quick judgement about the patient condition.  
keep the main shape of different type arrhythmia will greatly improve work efficiency.



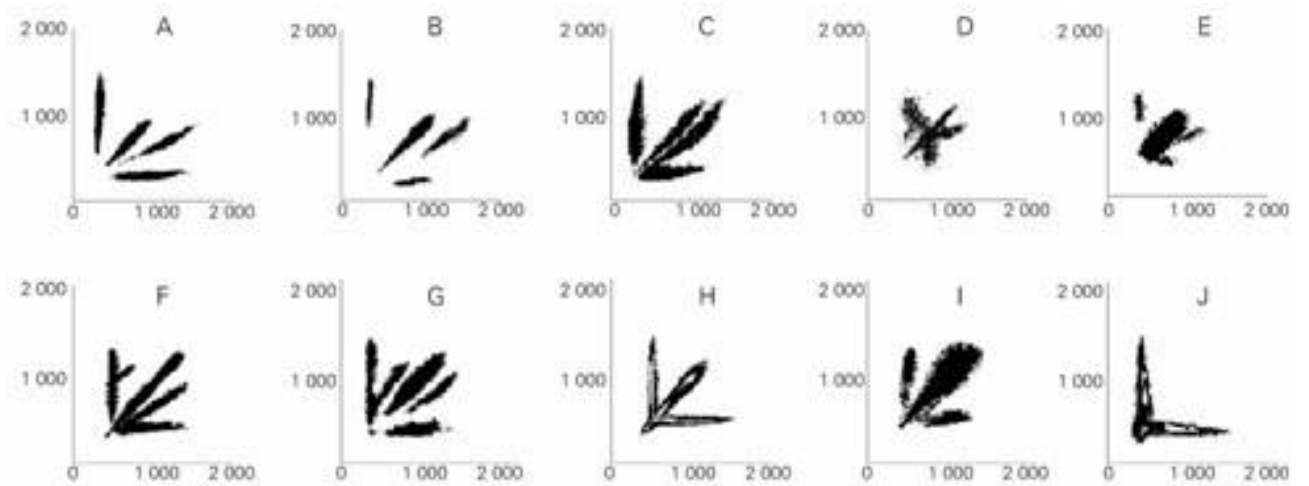
## 2.Lorenz Plot



**SVE in lorenz Plot**



**A ~ E**---Sinus rhythm with SVE  
**A** --- Fast sinus rhythm with SVE bigeminy  
**B** ---Slow sinus rhythm with SVE bigeminy  
**F, G, H** --- Sinus rhythm with frequent SVE,  
 SVE bigeminy.

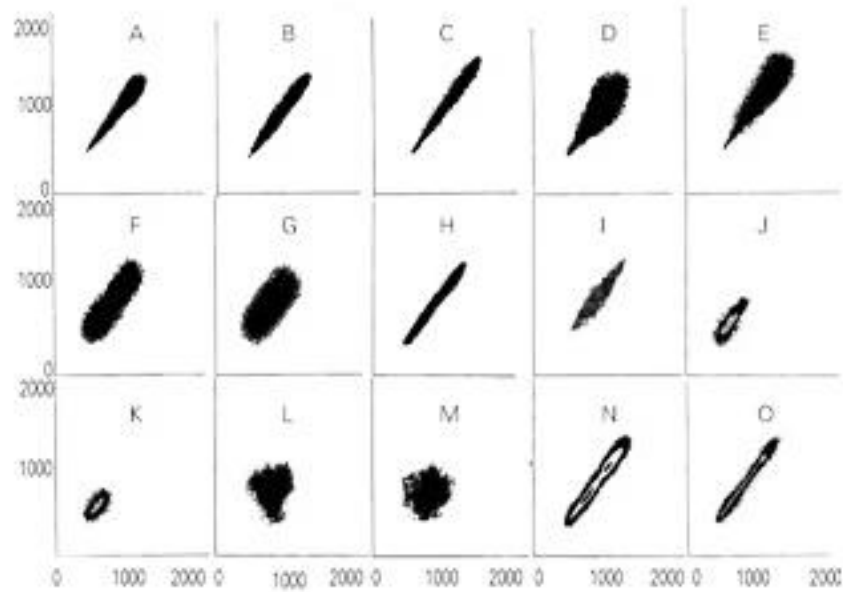


**VE in lorenz Plot**

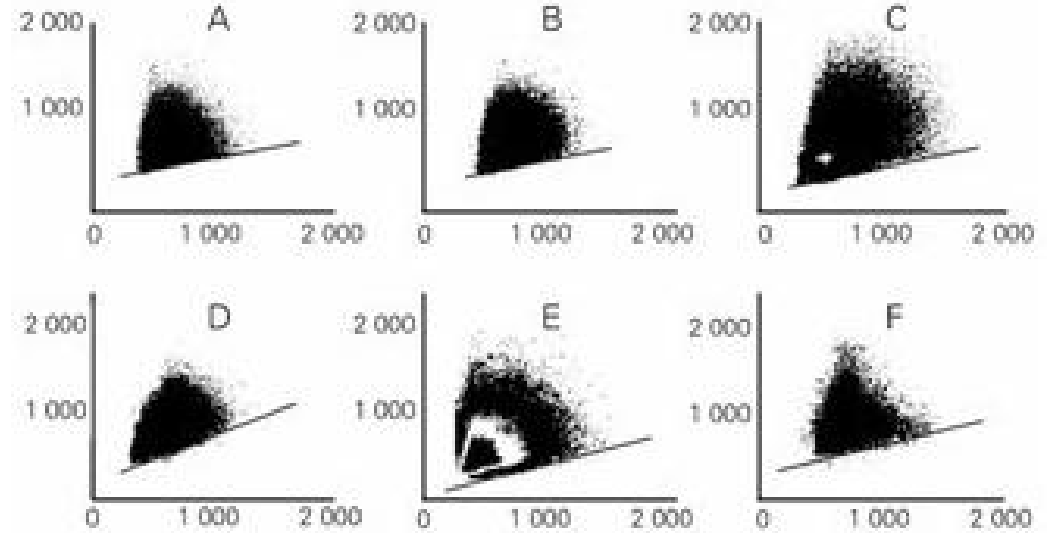


**A, B, C, E, F, G** --- sinus rhythm with frequent VE  
 or ventricular bigeminy ;  
**G** ---Sinus rhythm with VE and SVE;  
**H**---sinus rhythm with ventricular bigeminy ;  
**J**---Ventricular bigeminy

## 2.Lorenz Plot



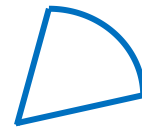
**Normal sinus rhythm in Lorenz Plot**



**A-fib in lorenz Plot**

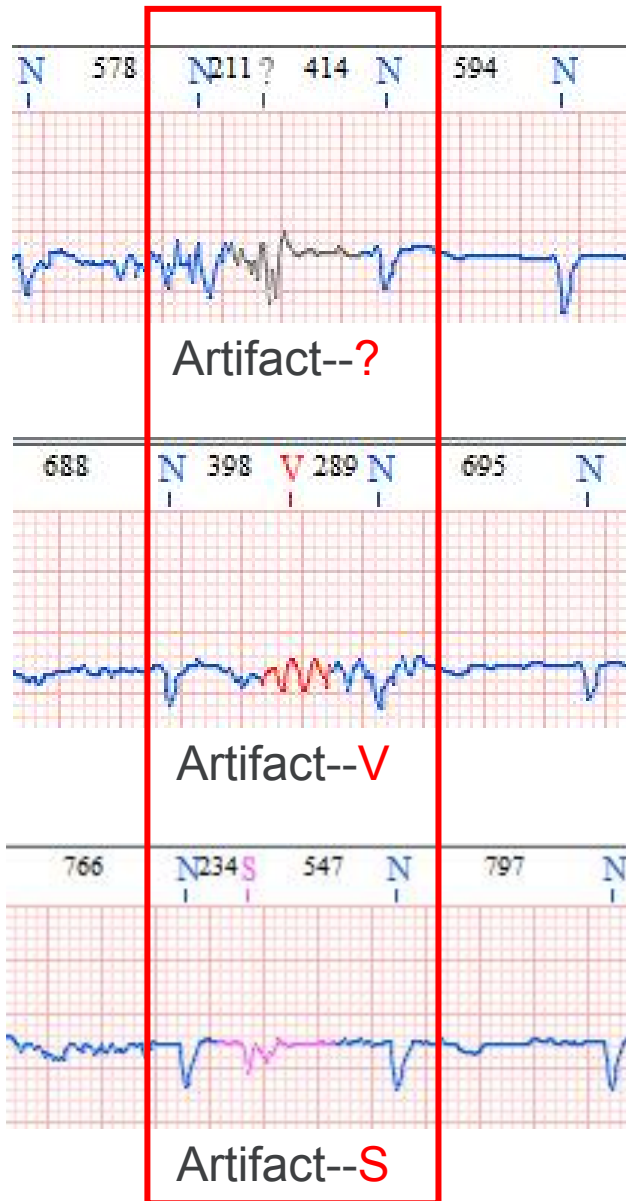


All scatter plots are located on the 45° line.



The shape of A-Fib in Lorenz Plot looks like a fan.

## 2.Lorenz Plot—Correct wrong marks by area.

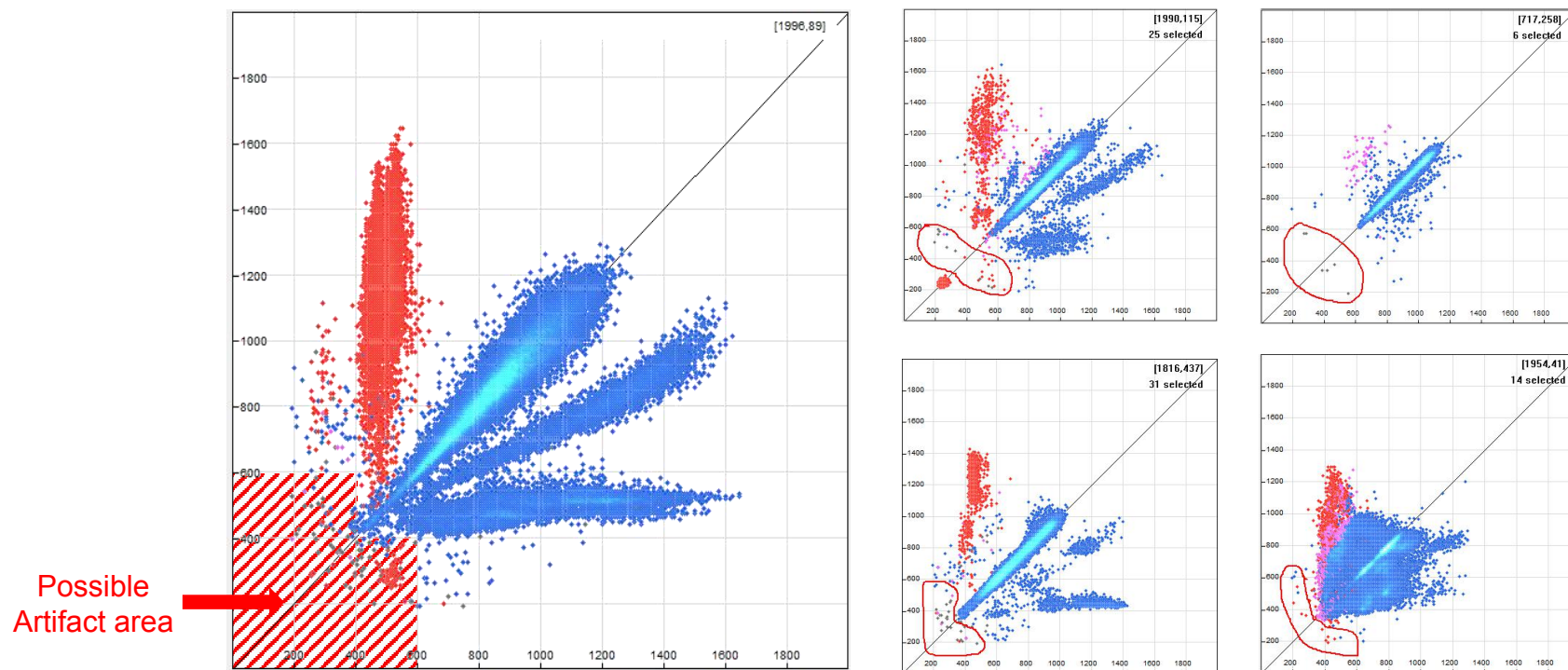


a).Check out Artifact

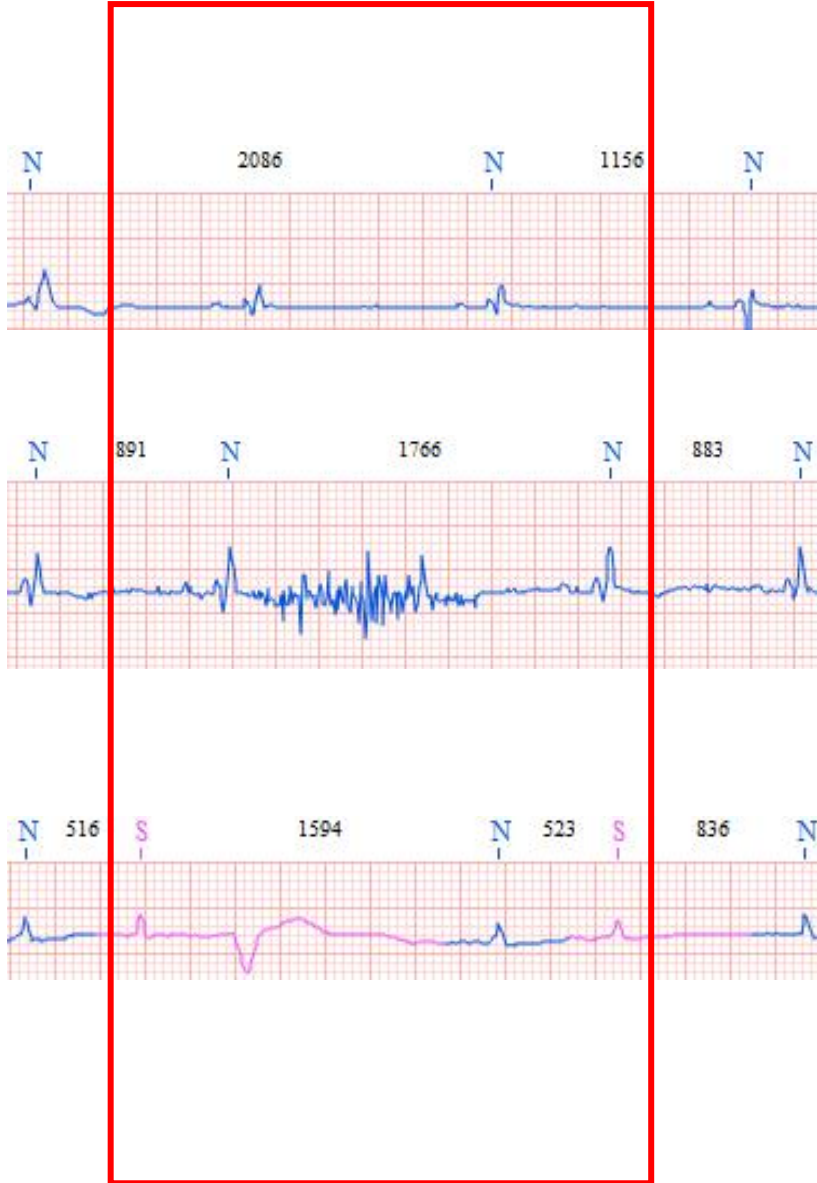
RR interval especially short if it's artifact,check out and delete them.

Check separate points in bellow area (the value is for reference,not fixed one)

- $X < 400\text{ms}$  &  $Y < 400\text{ms}$
- $X < 600\text{ms}$  &  $Y < 400\text{ms}$
- $Y < 600\text{ms}$  &  $X < 400\text{ms}$



## 2.Lorenz Plot—Correct wrong marks by area.

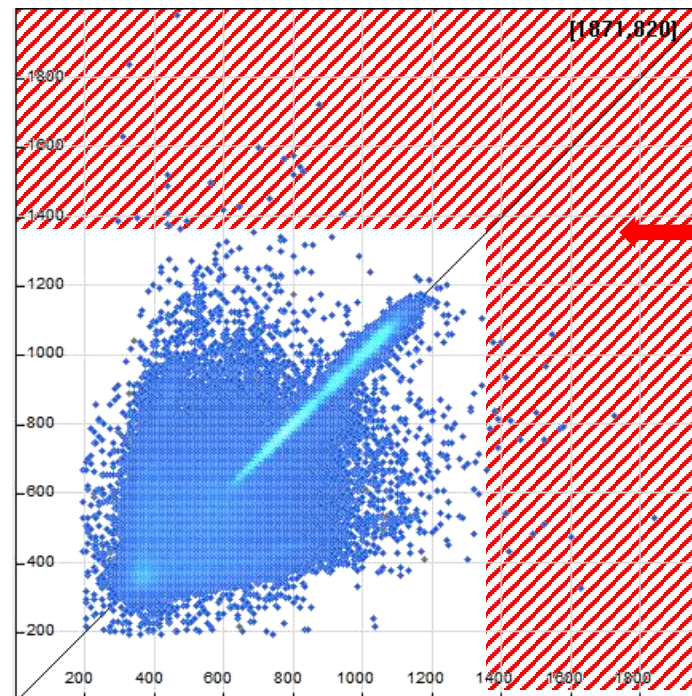


b).Check out mark missing

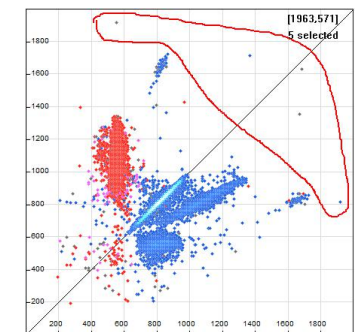
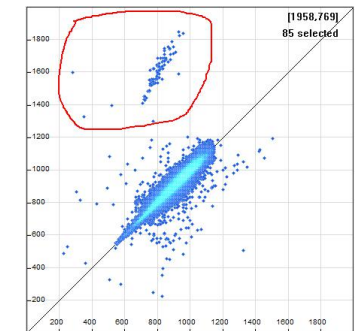
RR interval especially long if there is mark missing,check out and add the missing mark.

Check separate points in bellow area (the value is for reference,not fixed one)

- $X > 1400\text{ms}$  around  $2 * \text{Ave (RR interval)}$
- $Y > 1400\text{ms}$  around  $2 * \text{Ave (RR interval)}$



Possible  
mark missing  
area



## 2. Lorenz Plot — Correct wrong marks by area.

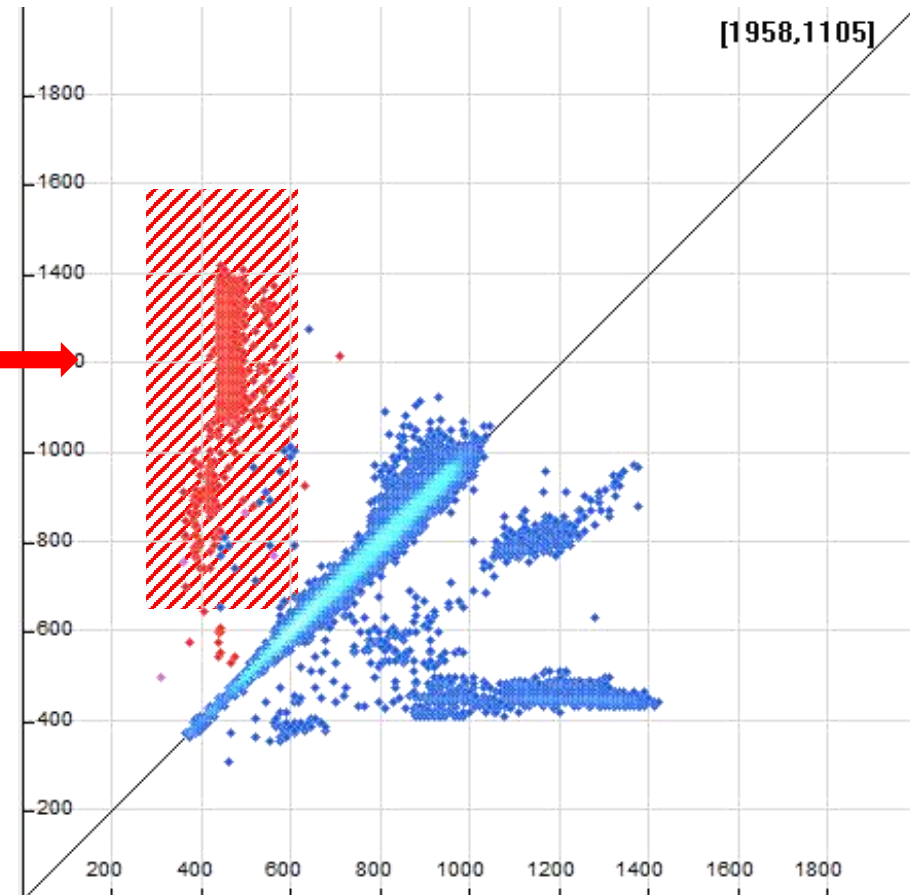


S--N

C). Check out wrong mark

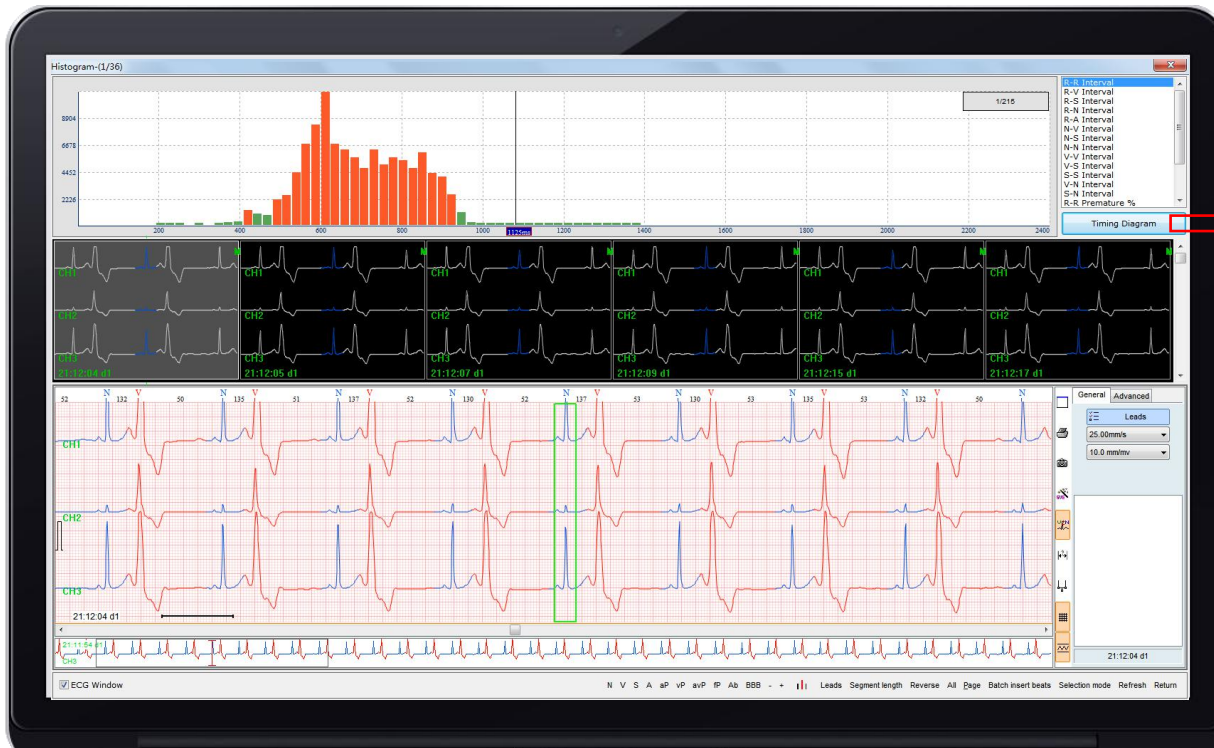
The point above  $45^\circ$  line normally will be S or V, check if there's N

Possible  
wrong mark area





### 3. Histogram



Click

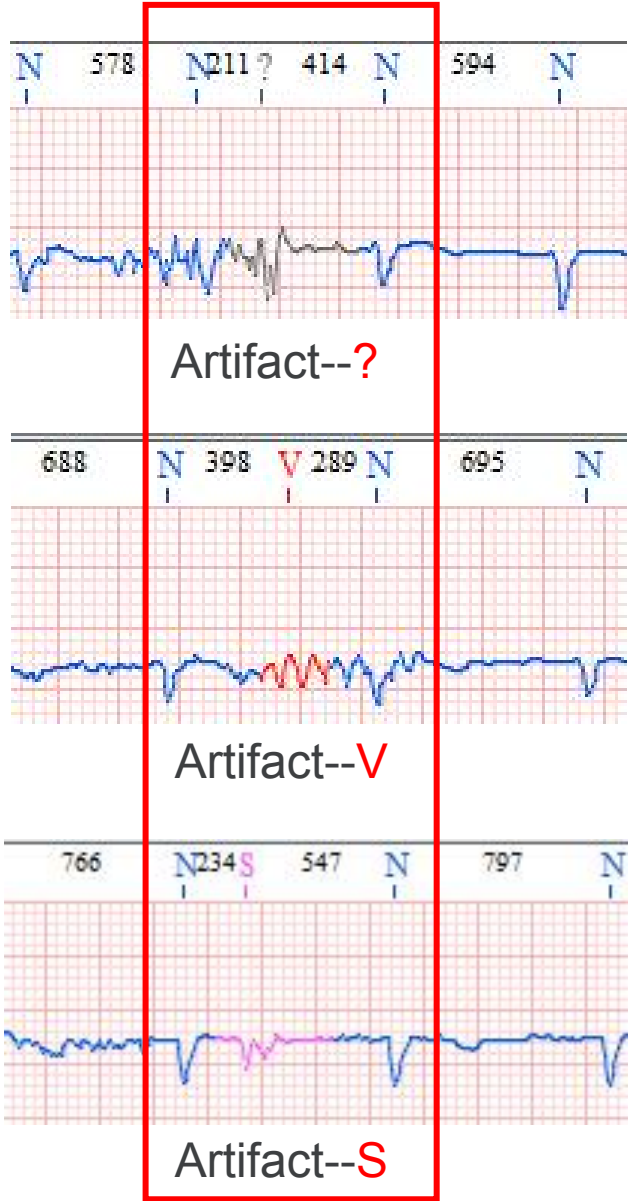


**Principle:** Different data statistics in histogram & Real time RR interval trend.

**Function:** Check all kinds of interval according to demand, find artifacts and missed mark



# 1.Check out Artifact

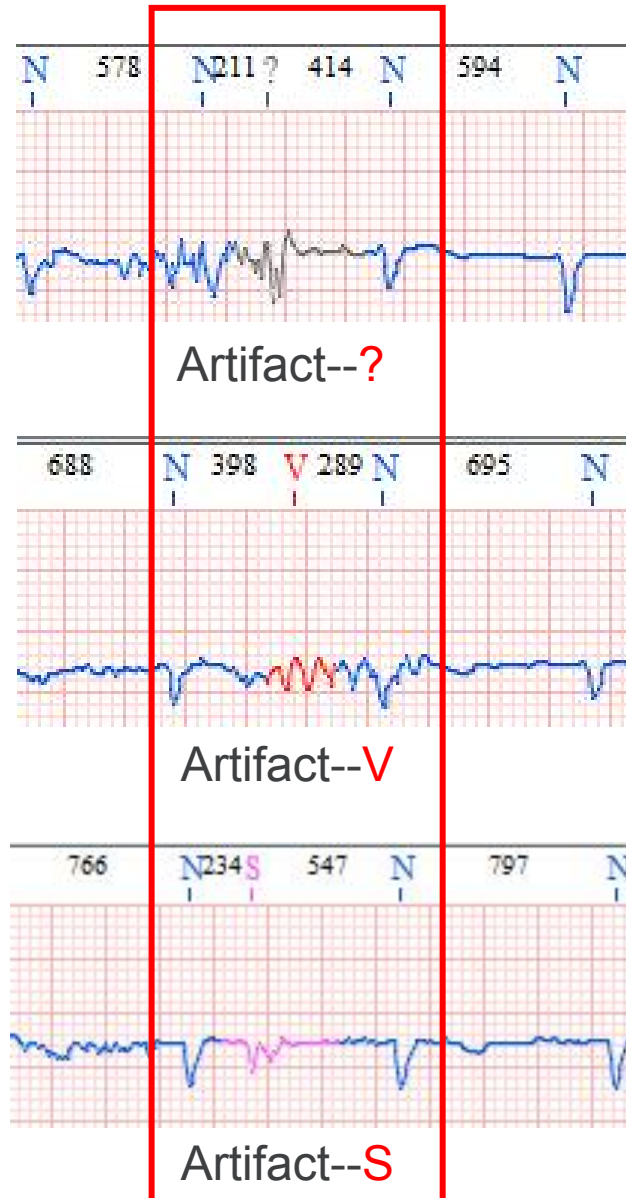


R-R interval < 300ms  
V-N interval < 400ms  
S-N / S-S interval < 400ms

Mostly there are artifacts  
Mostly there are artifacts marked into V  
Mostly there are artifacts marked into S



# 1. Check out Artifact



## Feature

RR interval especially short if it's artifact, check out and delete them.

## Useful tool 1---- Histogram

R-R interval < 300ms

Mostly there are artifacts

V-N interval < 400ms

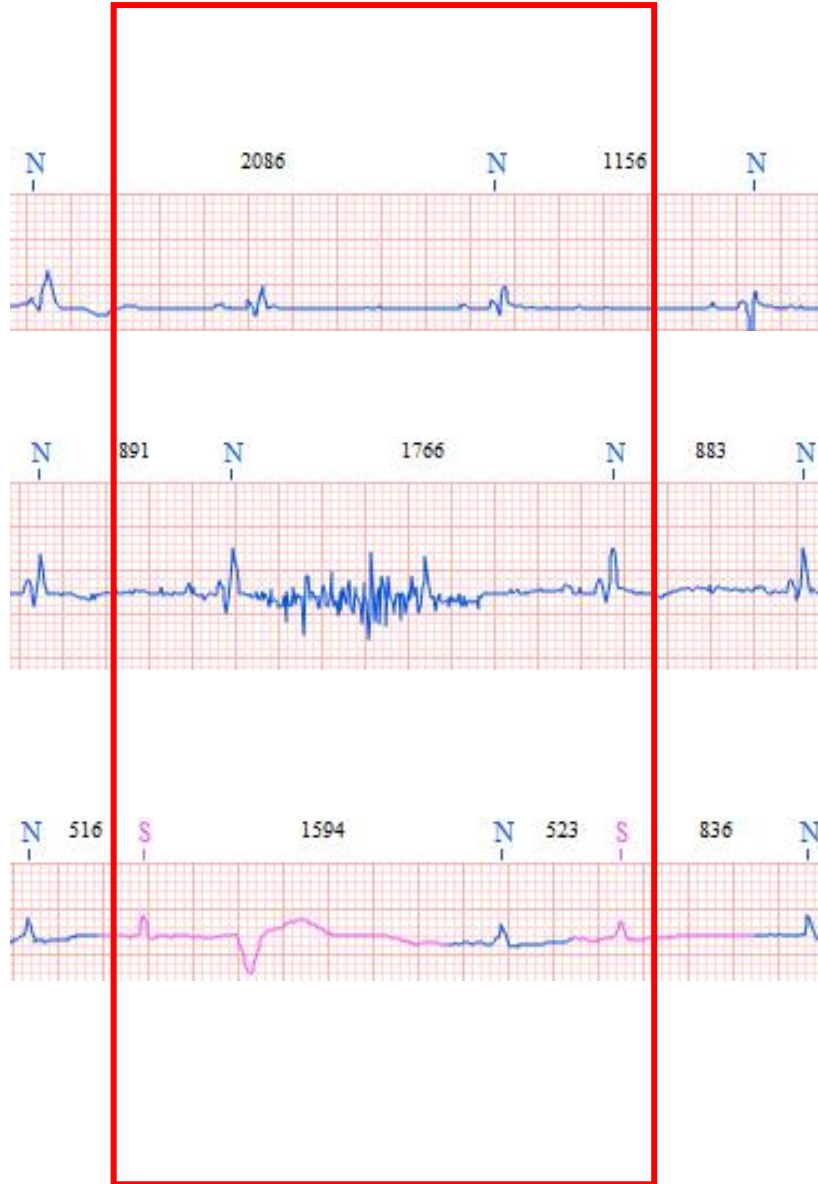
Mostly there are artifacts marked into V

S-N / S-S interval < 400ms

Mostly there are artifacts marked into S



## 2.Check out mark missing

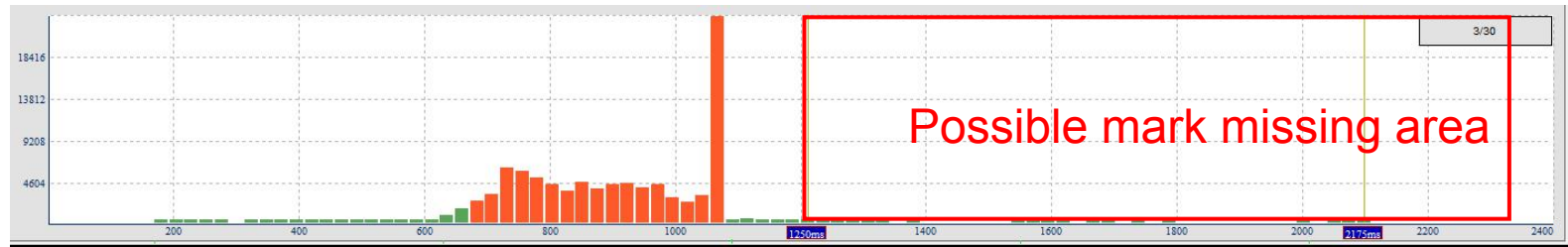


### Feature

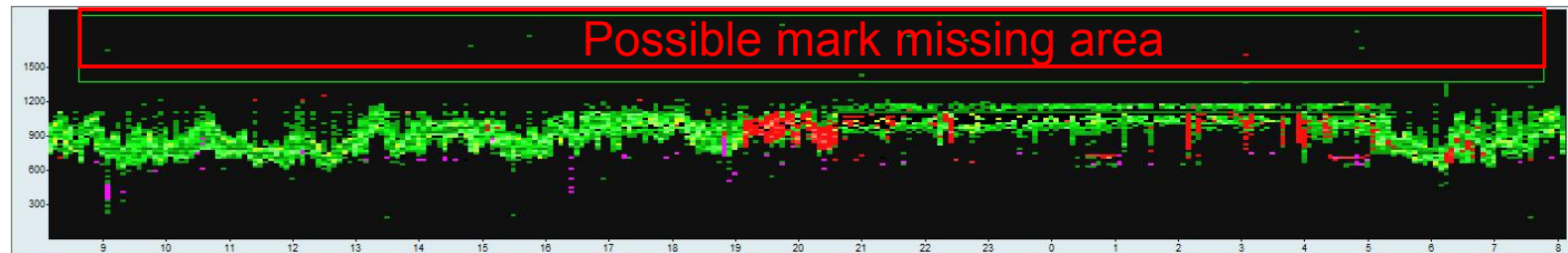
RR interval especially short if there is mark missing,check out and add the mark

### Useful tool 1.Histogram & Timing diagram

Check R-R interval from the longest RR period,there can be mark missing.



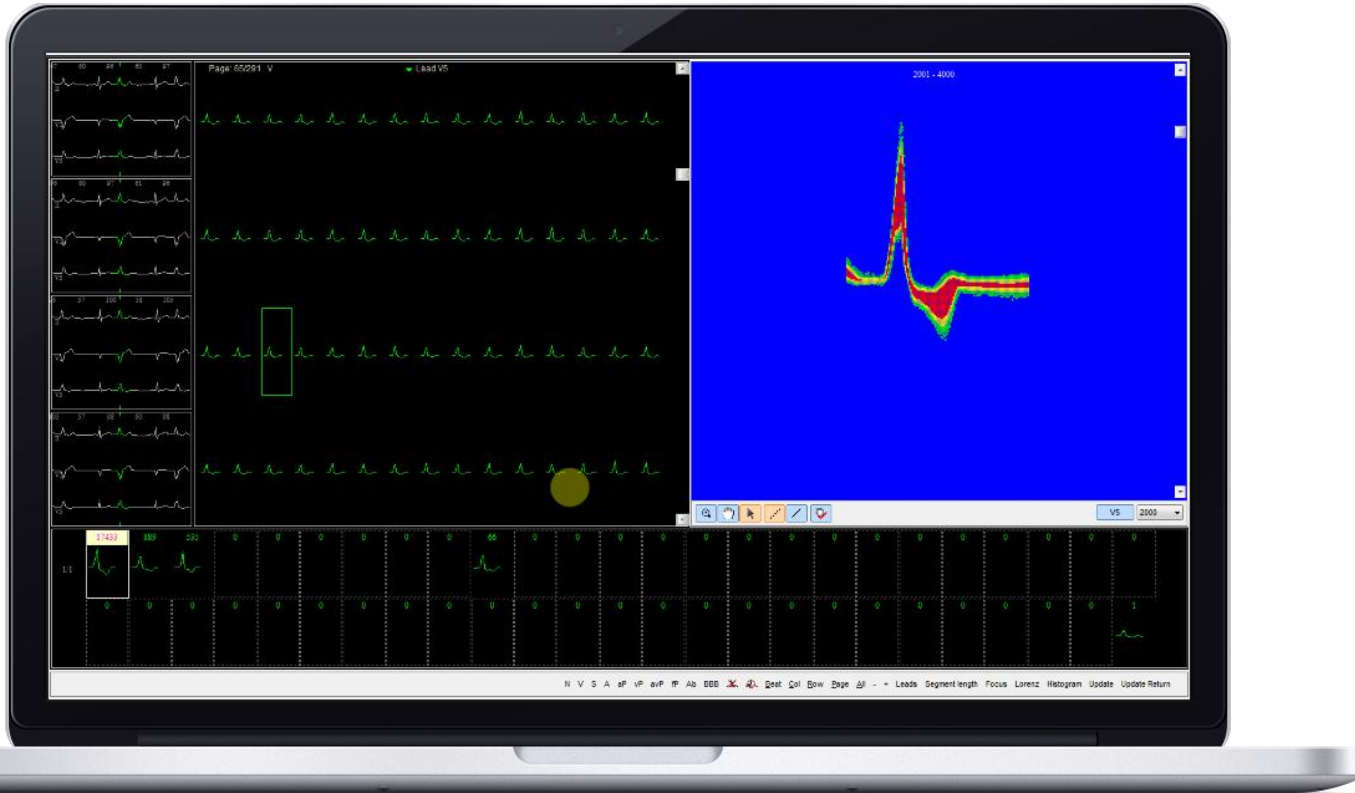
Histogram



Timing diagram in Lorenz plot tool



## 4.Focus --- Pick out the unusual waveform quickly



1. Change the utmost number.
2. Drag slider on the right
3. Use the mouse frame to select the unusual waveform, they will be separated into another folder bellow
4. check these beats seperately.

**Principle:** Overlap all waveform according to the order of P-QRS-T.

**Function:** Pick out the unusual waveform from large amount of beats.

## **Summary**

More small tools in ECGLab, try them one by one according to the manual book.

More instruction will update later.

Any questions feel free to contact us.



# THANKS

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